PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR JANUARY, 1928

[Data furnished by Prof. A. Wolfer, Zurich, Switzerland]

January	Relative numbers	January	Relative numbers	January	Relative numbers
1	68	11	79	21	70
2		12	78	22	52
3		13	54	23	61
4	80	14	61	24	94
5		15	62	25	116
6		16		26	113
7	83	17	75	27	143
8	93	18	62	28	94
9		19		29	89
10	80	20	55	30	69
				31	

Number of observations, 23; mean, 79.2.

FINAL SMOOTHED VALUES OF THE SUNSPOT RELATIVE NUMBERS FOR 1926 [1]

[Figures taken from Astronomische Mitteilungen, Zurich, September, 1927, p. 183]

Month	Number	Month	Number
January	71.8	August	61.6
February	70.0	September	60.8
March	62.5	October	71.5
April	38.5	November	60.5
May	64.3	December	79.4
June	73.5		
July	52.3	Year	63.9

[1] These figures replace the provisional values published in the MONTHLY WEATHER REVIEW, July, 1926 (p. 300), and January, 1927 (p. 30).

AEROLOGICAL OBSERVATIONS

By L. T. SAMUELS

Free-air temperatures were mostly above normal at the aerological stations, with the greatest departures occurring at Ellendale and Washington. (See Table 1.) The departures at both of these stations decreased with altitude, with the exception of the 500-meter and 750-meter levels. The fact that only a single observation at Ellendale reached to 4,000 meters explains the large departures found at and above that level.

Relative humidity departures were nearly all negative, whereas those for vapor pressure were about equally divided in sign.

Free-air resultant-wind directions were close to normal, but the velocities were considerably above normal. (See Table 2.)

Surface and upper-air maximum temperature records were exceeded at several stations on the 14th, when an extensive low-pressure area was centered over the middle of the country. Record temperatures occurred at the surface, 1,250 meters and 1,500 meters above Broken Arrow; at 3,500 meters and 4,000 meters above Due West; at the surface, 250 meters, 500 meters, and 3,500 meters above Groesbeck; at the surface, 1,000 meters, 2,000 meters, and 2,500 meters above Royal Center.

A 54 m. p. s. wind from the northwest was observed at 9,500 meters above Groesbeck on the morning of the 2d. This was well substantiated by a nephoscope observation on cirrus clouds made during the afternoon of that day which indicated a velocity of 55 m. p. s. At this time there was a latitudinal surface temperature gradient of 25° C. between this station and the northern part of the United States. On the 5th when the latitudinal surface temperature gradient over this same region was practically zero the winds over Groesbeck averaged 4 meters per second and did not exceed 10 meters per second to at least 10,000 meters.

Examples of pronounced surface-temperature inversions are shown by the kite records of Due West and Broken Arrow on the 6th and 11th, respectively. At the former station the temperature rose 12.7° C. throughout the first 150 meters, and at Broken Arrow the temperature at 390 meters was 16.4° C., while at the surface it was 5.0° C. Both of these observations were made near the center of an anticyclone where conditions were favorable for intense nocturnal radiation.

TABLE 1.—*Free-air temperatures, relative humidities, and vapor pressures during January, 1928*

TEMPERATURE (°C.)

Altitude (meters) m. s. l.	Broken Arrow, Okla. (233 meters)		Due West, S. C. (217 meters)		Ellendale, N. Dak. (444 meters)		Groesbeck, Tex. (141 meters)		Royal Center, Ind. (225 meters)		Washington, D. C. (7 meters)[1]	
	Mean	Departure from 10-year mean	Mean	Departure from 7-year mean	Mean	Departure from 11-year mean	Mean	Departure from 10-year mean	Mean	Departure from 10-year mean	Mean	Departure from 3-year mean
Surface	3.8	+0.3	5.2	−0.6	−8.4	+2.2	9.2	+1.2	−4.5	−0.6	3.3	+3.8
250	3.8	+0.3	5.1	−0.6			9.2	+1.4	−4.7	−0.6	2.5	+3.2
500	3.9	+0.7	5.7	+0.4	−8.0	+2.5	9.1	+1.6	−5.5	−0.5	2.5	+3.5
750	3.3	+0.3	5.5	+0.6	−6.1	+3.5	8.6	+1.2	−5.1	0.0	2.2	+3.6
1,000	3.1	0.0	4.7	+0.4	−5.4	+2.8	7.8	+0.4	−5.0	0.0	1.0	+3.1
1,250	2.9	−0.2	4.1	+0.5	−5.7	+1.7	7.5	+0.4	−5.3	−0.2	−0.1	+2.6
1,500	2.5	−0.3	3.2	+0.4	−6.3	+1.2	6.4	−0.1	−6.2	−0.7	−1.2	+2.1
2,000	0.9	−0.5	1.3	+0.4	−8.5	+0.6	4.2	−0.6	−7.4	−0.8	−3.6	+1.2
2,500	−1.1	−0.2	−1.1	0.0	−10.7	+0.6	2.4	−0.3	−8.9	−0.4	−5.9	+0.8
3,000	−3.7	−0.3	−2.8	+0.5	−13.2	+0.7	−0.1	−0.5	−11.3	−0.5	−9.4	−0.6
3,500	−6.5	−0.5	−4.6	+0.9	−16.2	+0.5	−2.7	−0.3	−13.7	−0.4	−11.8	−0.6
4,000	−9.1	−0.3	−5.9	+2.5	−17.3	+2.0	−4.7	−0.4	−16.1	−1.3		
4,500			−7.4	+3.6	−18.7	+3.3	−6.8	−1.1	−19.0	−1.6		

RELATIVE HUMIDITY (%)

Surface	61	−9	66	−1	74	−7	70	−7	79	0	59	−8
250	61	−9	65	−1			67	−8	79	0	58	−6
500	54	−10	59	−2	71	−8	61	−10	76	+1	55	−5
750	52	−8	56	−2	60	−12	56	−11	68	−2	53	−5
1,000	50	−5	53	−3	56	−9	52	−10	60	−5	53	−5
1,250	48	−3	51	−3	55	−5	47	−10	56	−4	54	−4
1,500	45	−2	50	−2	52	−6	46	−7	55	−2	56	−1
2,000	41	−1	50	+2	50	−7	43	−5	47	−5	58	+2
2,500	40	−1	52	+8	48	−9	39	−6	47	−5	58	+4
3,000	35	−6	43	+3	47	−10	37	−5	40	−13	57	+2
3,500	38	−4	37	0	53	−2	33	−7	34	−21	42	+2
4,000	30	−13	34	−5	47	−6	27	−11	31	−23		
4,500			32	−6	47	−9	26	−11	30	−22		

VAPOR PRESSURE (Mb)

Surface	5.26	−0.53	6.69	−0.05	2.86	+0.37	9.17	+0.32	4.16	+0.24	5.15	+0.83
250	5.23	−0.52	6.65	−0.01			8.76	+0.26	4.11	+0.27	4.84	+0.70
500	4.75	−0.40	6.43	+0.32	2.79	+0.35	7.80	−0.02	3.83	+0.43	4.64	+0.70
750	4.34	−0.33	6.06	+0.32	2.54	+0.26	6.93	−0.29	3.46	+0.35	4.43	+0.66
1,000	4.05	−0.18	5.49	+0.13	2.37	+0.15	6.02	−0.50	3.02	+0.17	4.12	+0.59
1,250	3.74	−0.07	5.06	+0.17	2.25	+0.10	5.14	−0.69	2.71	+0.12	3.79	+0.50
1,500	3.40	0.00	4.61	+0.27	2.04	+0.02	4.55	−0.65	2.37	+0.02	3.63	+0.53
2,000	2.74	−0.02	3.89	+0.39	1.70	−0.04	3.48	−0.65	1.90	−0.03	3.05	+0.42
2,500	2.38	+0.05	3.30	+0.66	1.33	−0.09	2.45	−0.86	1.40	−0.24	2.33	+0.20
3,000	1.85	−0.13	2.46	+0.47	1.02	−0.08	1.67	−0.94	1.01	−0.41	1.72	−0.09
3,500	1.63	−0.08	1.30	−0.13	0.91	+0.11	0.88	−1.18	0.84	−0.40	1.02	−0.09
4,000	1.08	−0.36	0.96	−0.24	0.86	+0.27	0.26	−1.41	0.16	−0.80		
4,500			0.66	−0.35	0.84	+0.25	0.13	−1.30				

[1] Naval Air Station, Anacostia, D. C.